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United States Telephone Association

1401 H Street, N.W., Suite 600
Washington, D.C. 20005-2136
(202) 326-7300
(202) 326-7333 FAX

September 29, 1994

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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

Mr. William F. Caton
Acting Secretary
Federal Communications Commission
1919 M Street, N.W., Room 222
Washington, D. C. 20554

DOCKET FILE COPY ORIGINAL

Re: Ex Parte Meetings
CC Docket No. 94-1

Dear Mr. Caton:

On September 28, 1994, Whit Jordan, Mike O'Brien, Bill Taylor, Laurits Christensen, and Frank McKennedy, representing the United States Telephone Association (USTA), met with Kathleen Wallman, Anna Gomez, Anthony Bush, Mark Uretsky, Dan Grosh, David Nall and Alex Belinfante of the Common Carrier Bureau. The attached document, labeled Attachment 1, was distributed and discussed. The discussion was consistent with USTA's written filings in this docket.

In a separate meeting, USTA's representatives met with Dan Grosh, Mark Uretsky, Anthony Bush, Fatina Franklin and Alex Belinfante of the Common Carrier Bureau. The attached document, labeled Attachment 2, was distributed and discussed. This discussion was consistent with USTA's written filings in this docket.

The original and a copy of the ex parte meeting notice are being filed in the Office of the Secretary on September 29, 1994 due to the lateness of the meetings. In addition, Attachment 2 is also being filed on diskette in the Office of the Secretary and with International Transcription Service. Please include it in the public record of this proceeding.

Respectfully submitted,

Linda Kent

Linda Kent
Associate General Counsel

Attachments
cc: Kathleen Wallman
Anna Gomez
Anthony Bush
Mark Uretsky
Dan Grosh
David Nall
Alex Belinfante
Fatina Franklin

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ATTACHMENT 1

USTA
Productivity
CC Docket No. 94-1
LEC Price Cap Performance Review

The Commission Should Adopt a Corrected, Lower Productivity Offset

- Should be based on Long Term Total Factor Productivity (TFP)
  - TFP study is not affected by arbitrary cost allocations of common costs
  - Based on historical verifiable data
  - No legitimate basis for a separate additive productivity offset in common line ("g")
- Should subtract U.S. TFP from Price Cap LECs TFP

Christensen Associates performed a TFP study of the price cap LECs

- Study represented 95% of the price cap LECs
- Period studied was from 1984 - 1992
- Resulted in a TFP differential of 2.3%

Price Cap LECs TFP	2.6%
Minus U.S. TFP	.3%
TFP Differential	2.3%

- Christensen Associates performed extensive reviews of data for reasonableness and appropriateness
- Based on publicly available data

NERA updated Frentrup/Urestky and Spavins/Lande Studies

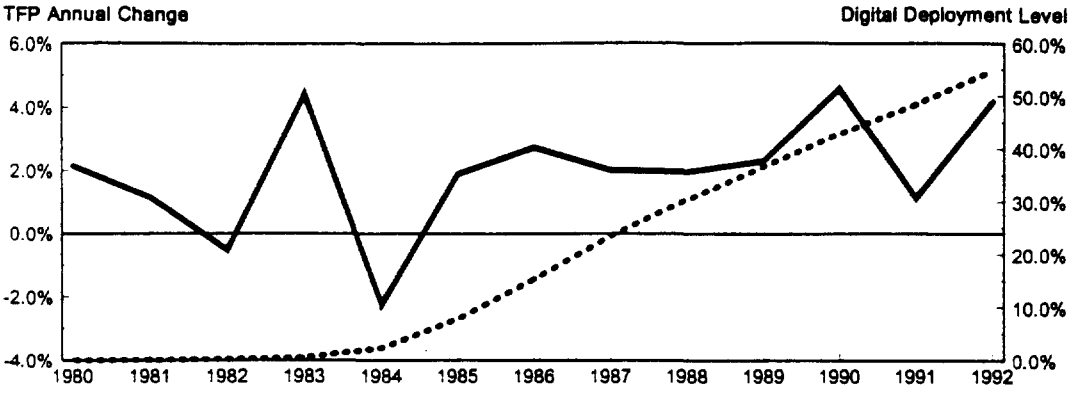
- Updated Frentrup/Urestky study to use actual historic data through 1992. (2.7%)
- Updated Spavins/Lande study through 1992. (2.1%)
- The average of these two studies (2.4%) support reasonableness of Christensen Associates study of 2.3%

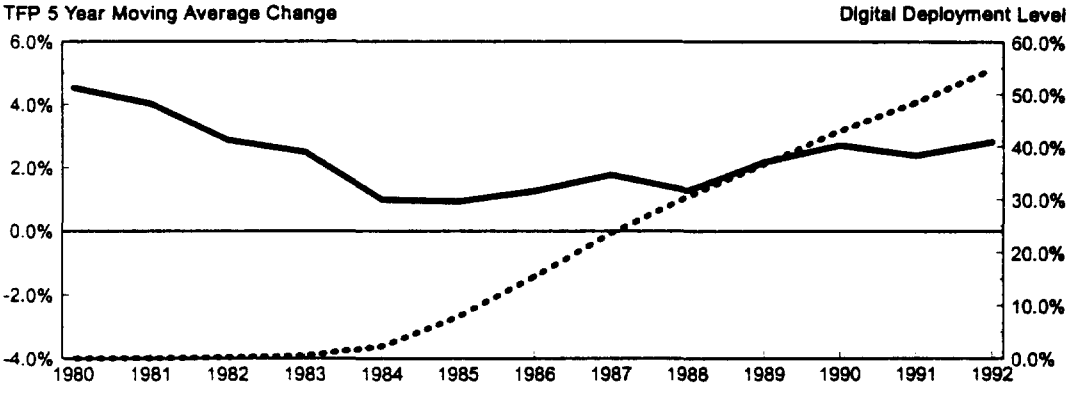
There is no rationale to increase the productivity offset

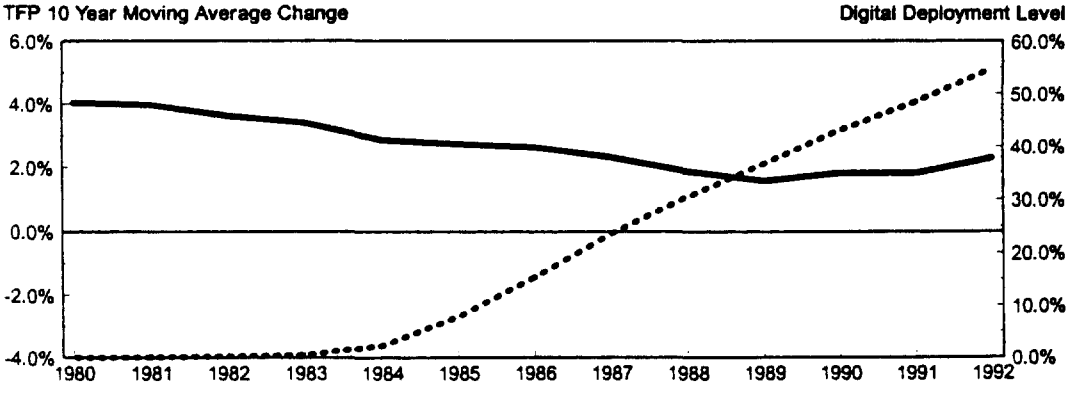
- No need for input price adjustment
- Productivity offset higher than historic TFP would not mirror the competitive market place
- Consumer Productivity Dividend (CPD) should be eliminated
- CPD is not included in a competitive market place
- Higher productivity offset than historic TFP results in a disincentive
- IXCs have benefited by a total of $2 Billion for CPD
- Amount embedded in Price Cap LECs' rates annually will be $1 Billion for CPD

Summary of Telecommunications Productivity Studies

Study	TFP	TFP Differential	Period
American Productivity & Quality Ctr Communications Industry	3.9	2.2	1948-85
AT&T Bell System Study Bell System	3.2	1.9	1947-79
Christensen, Christensen & Schoech Bell System	3.2	2.1	1947-79
Christensen, Schoech & Meitzen LEC Industry	2.6	2.3	1984-92
Crandall & Galst Total Industry	3.3	2.2	1960-88
Jorgenson, Gollop & Fraumeni Telephone, Telegraph & Misc. Comm.	2.9	2.1	1948-79
Spavins Indirect Total Industry		1.85	1930-89

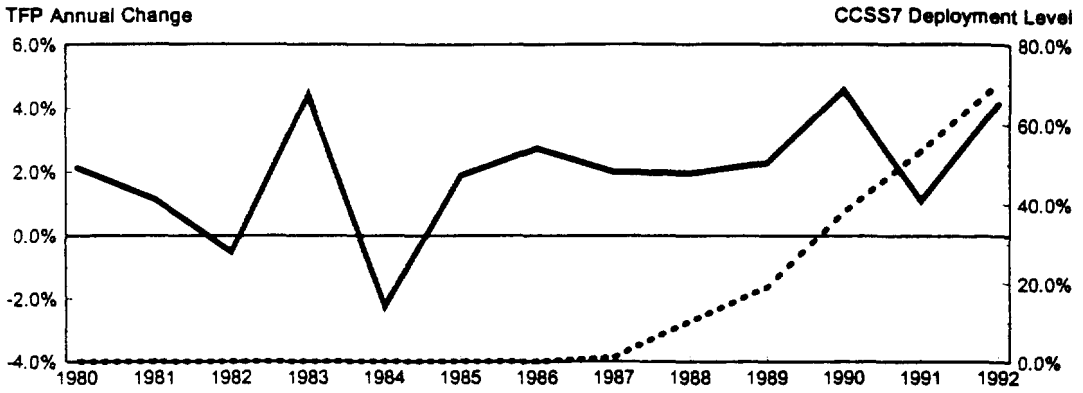


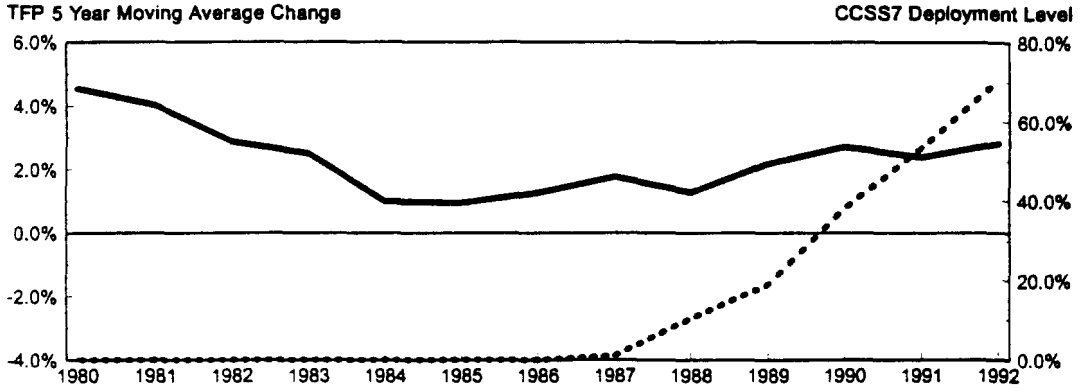


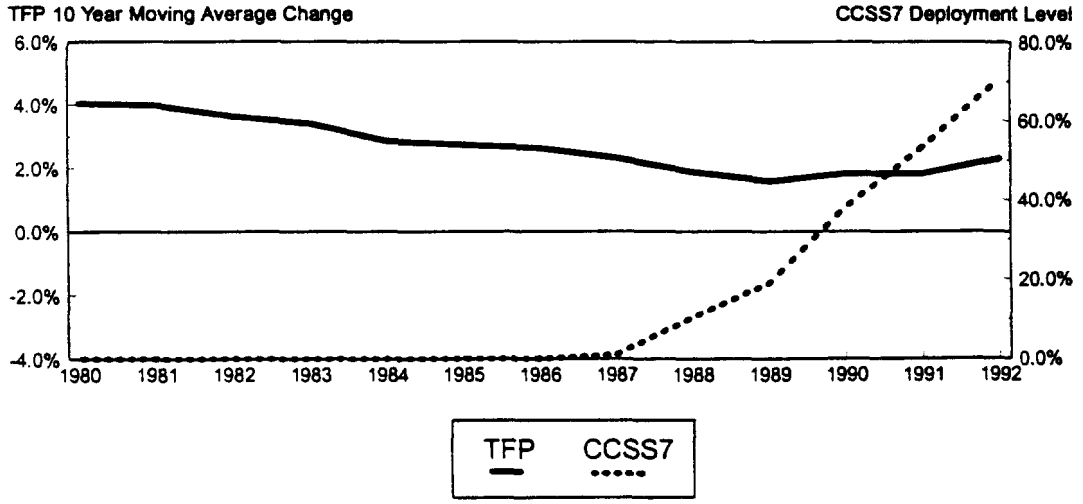


Notes

1. TFP Data from 2 Studies by Laurits Christensen:
   a. "Total Productivity Growth in the U.S. Telecommunications Industry and the U.S. Economy: 1951-1987" filed in North Dakota Public Service Commission Case No. PU-2320-90-149, October 1, 1990.
   b. "Productivity of the Local Operating Telephone Companies Subject to Price Regulation." filed in CC Docket 94-1, May 3, 1994
2. Technology Data from Tables 1 through 8 of data submitted by selected LECs in response to the Order in FCC 89-624 dated December 12, 1990 and updated with data from the annual FCC Report 43-07. Technology data is from all BOCs.







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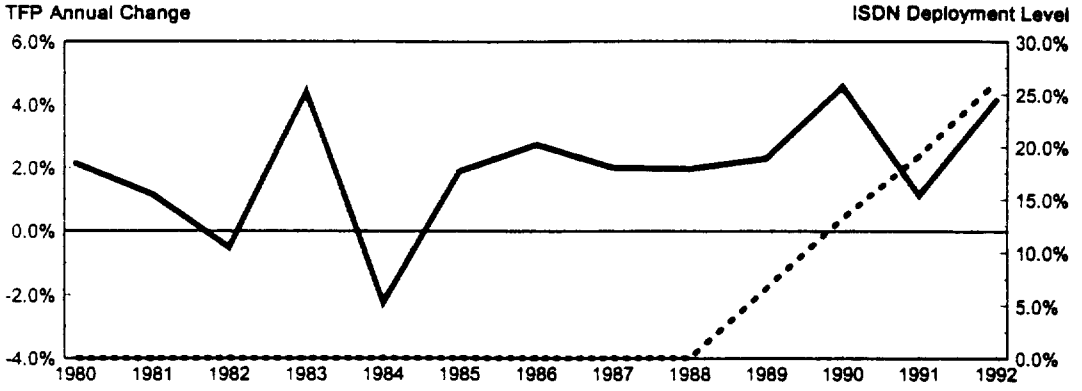

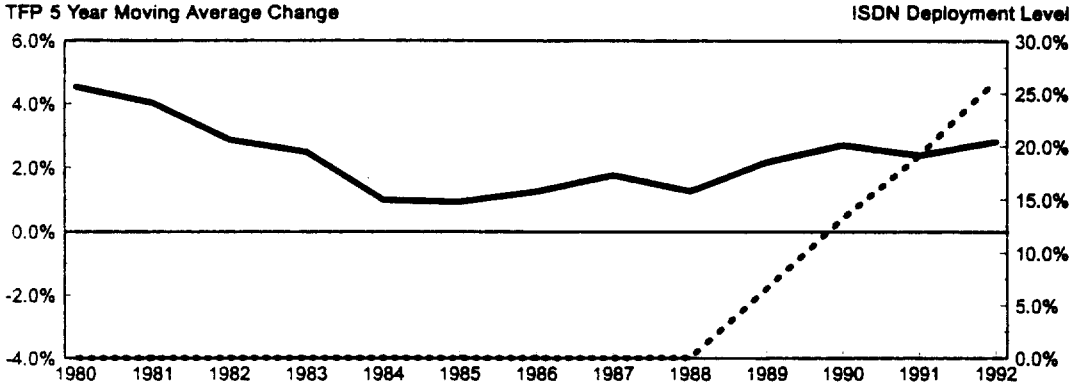

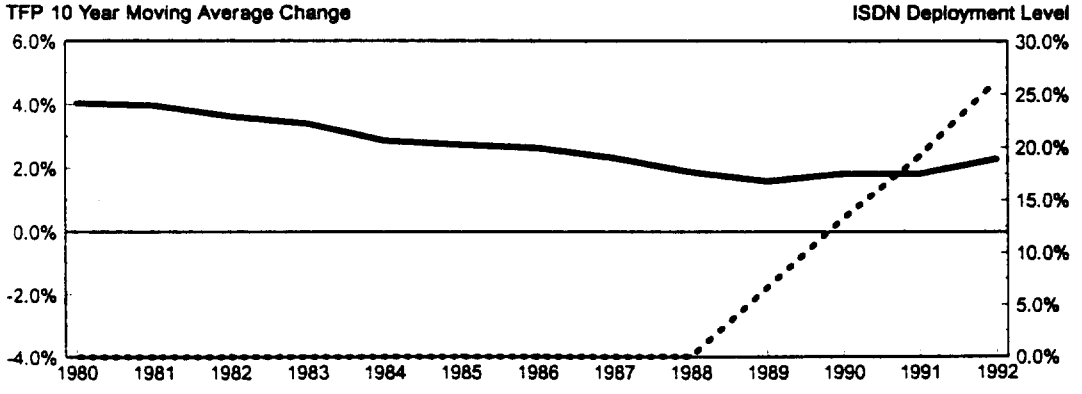

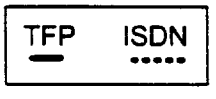

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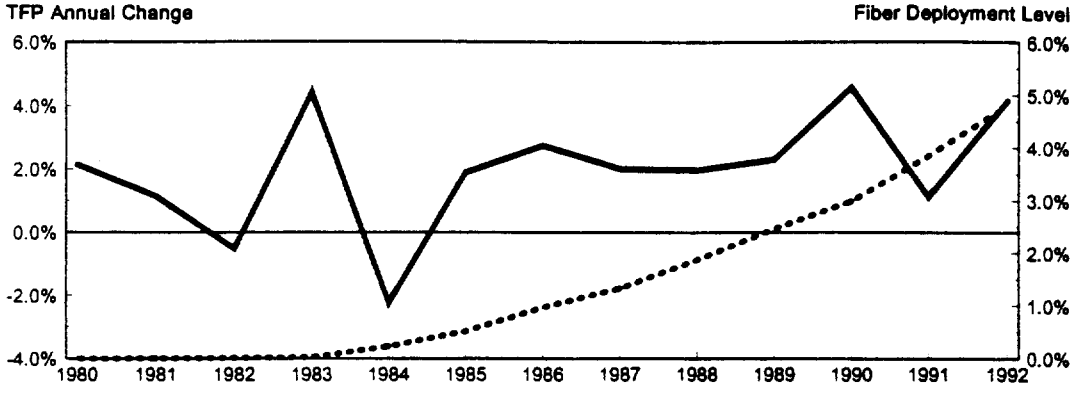

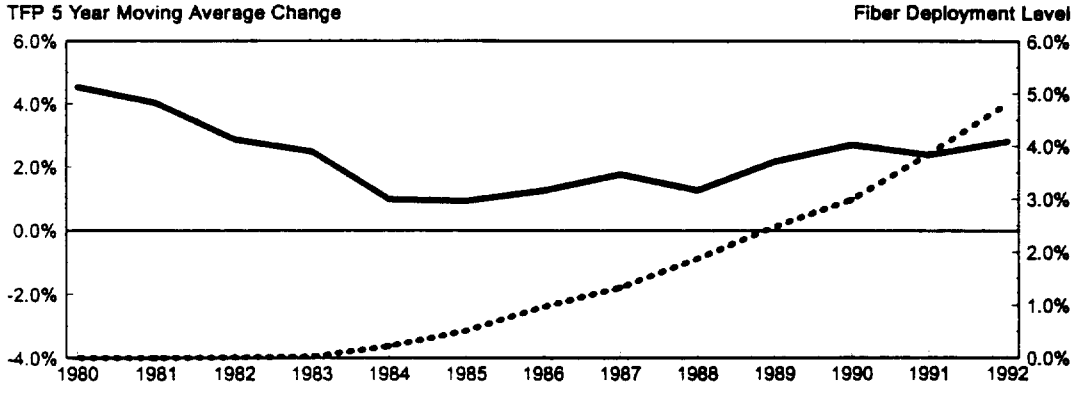

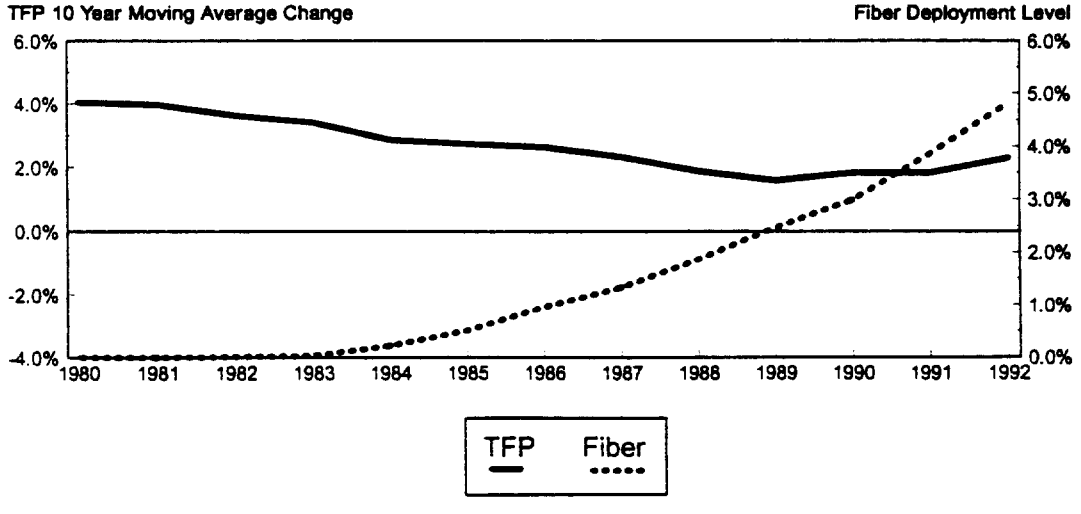

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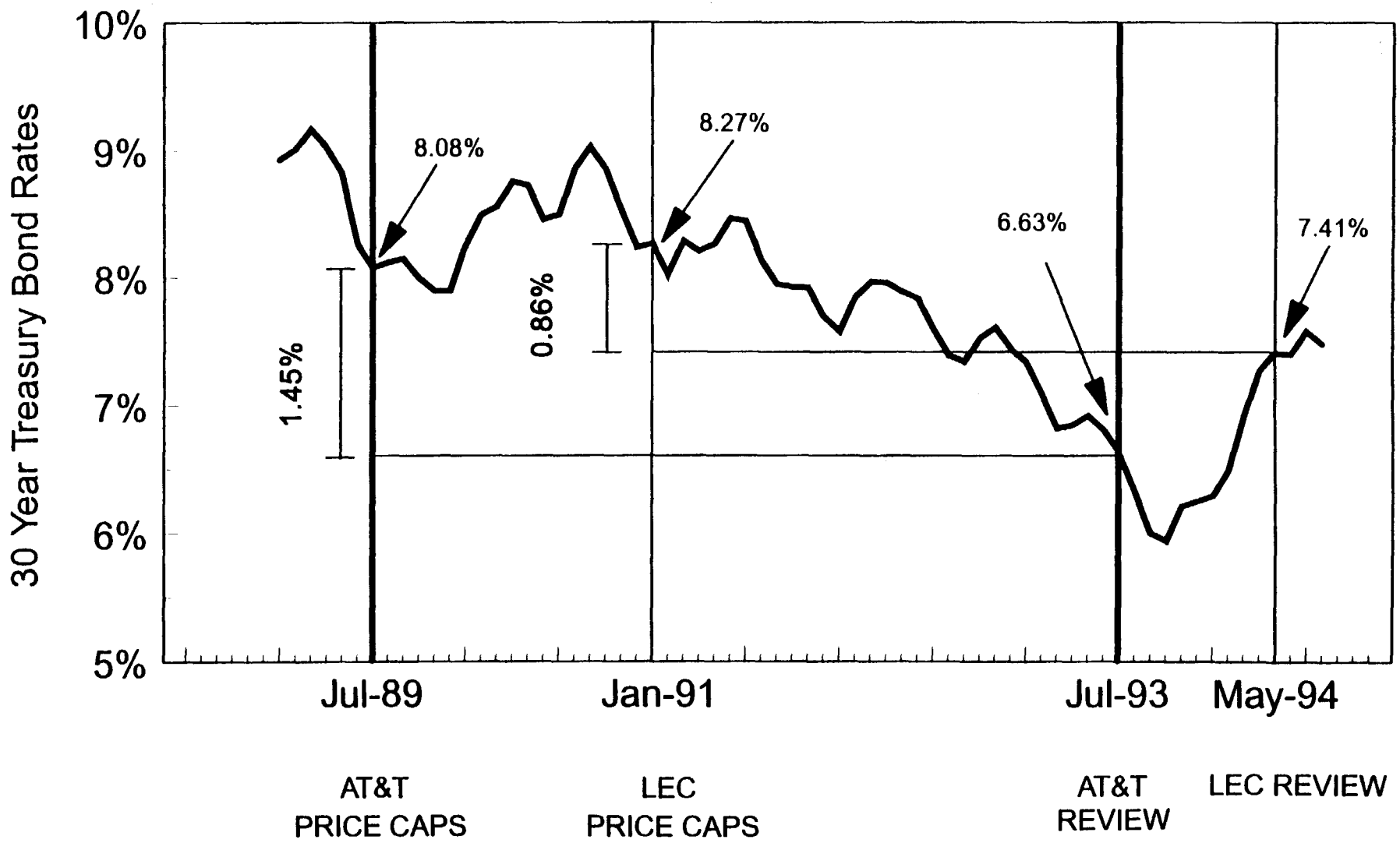
Interest Rates Fell Further Under the AT&T Price Cap Plan Than Under the LEC Price Cap Plan



ATTACHMENT 2

AN UPDATE OF THE FCC SHORT-TERM PRODUCTIVITY STUDY FOR LOCAL EXCHANGE CARRIERS: 1984-1992

Prepared by

National Economic Research Associates, Inc.

Prepared for

United States Telephone Association

September 1994

A Marsh & McLennan Company

White Plains, NY / Washington, DC / Los Angeles/Cambridge, MA / Philadelphia / San Francisco/New York, NY / Ithaca, NY / Seattle/London / Madrid

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An Update of the FCC Short-Term Productivity Study For Local Exchange Carriers: 1984-1992

I. BACKGROUND

This study has been prepared on behalf of the United States Telephone Association (USTA) and its members. The purpose of the study is to evaluate and update the calculation methodology employed in the CC Docket No 87-313 Second Report and Order to determine the appropriate productivity offset (X) applicable to the group of Tier-1 local exchange carriers (LECs). The overall objective of the study is to assess the productivity offset of 3.3 (and, optionally, 4.3) percent under which most Tier-1 LECs operated during the 1991 and 1992 periods. We calculate the value of X in the FCC's Balanced 50/50 price cap formula that would be required to obtain the same growth in interstate access prices that would have been observed from 1984/85 through 1992 if earnings had been constant.

We generally replicate the method used by J. Christopher Frentrup and Mark I. Uretsky (F-U) in their report prepared for the FCC, *A Study of Local Exchange Carrier Post-Divestiture Switched Access Productivity*.[1] Since the FCC relied on the F-U study in its determination of an initial value of the productivity offset, it seems likely that an update of the F-U study would be used by the FCC to evaluate the parameters of the plan in light of two additional years of experience. While we replicated the original F-U method, there are three small but important differences between

[1]Presented as Appendix C of the Federal Communications Commission Second Report and Order in CC Docket No 87-313, released October 4, 1990.

this study and the F-U study: the analysis period, the method employed to calculate demand stimulation and the treatment of stimulation of traffic sensitive (TS) demand.[2]

(i) This study examines switched service data for eight access periods: 1984/85, 1985/86, 1986/87, 1988, annualized 1989, 1990, 1991 and 1992, using data provided by the LECs. Only six periods of data were available when the F-U study was conducted in 1990: 1984/85, 1985/86, 1986/87, 1988, annualized 1989 and forecast 1990/91. The last two periods in the current analysis are price cap periods during which most--but not all--companies operated under price cap regulation with a productivity offset of 3.3 percent.

(ii) This study examines the effect of using the initial period and the end period as a base for calculating demand stimulation due to factors unrelated to productivity growth. In the F-U study, demand stimulation calculated with a 1984/85 period base--i.e., stimulation that actually occurred after 1984/85 due to price reductions stemming from exogenous cost reductions and subscriber line charge increases--was removed from common line (CL) minutes. It would be equally correct, in principle, to calculate stimulation from a 1992 period base, adding to CL minutes the stimulation that would have occurred prior to 1992 if prices had been set using exogenous cost and subscriber line charge rules as they were in 1992. In this study the calculations use a 1984/85 period base.

(iii) This study recalculates the effect of demand stimulation on TS prices. For CL, changes in demand volumes (due to exogenous cost changes) flow directly through to changes in average revenue per minute because there is no effect of usage volume changes on

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[2]Demand stimulation is the increase (or decrease) in end-user demand for minutes of use that results from the difference in price levels that would have prevailed under the price cap formula and price levels that otherwise would have prevailed during an access period.

non-traffic sensitive (NTS) costs. For TS usage, the opposite is true: an increase in demand will, to a first approximation, increase revenue at the same rate as costs and thus impart no bias to a direct measurement of productivity change from price change. However, a component of TS costs (line termination) is actually NTS, so stimulation from exogenous cost changes does affect measured TS productivity growth. In previous filings--and in the stimulation used by F-U--adjustment for the NTS component of TS costs was made to demand: the CL stimulation percentage was reduced to reflect the fact that only a fraction of TS revenue is NTS. Since the effect of additional TS usage is to increase TS costs, the proper way to account for this change is to adjust revenue, not demand.

The results of the study show that recalculated LEC productivity offsets for interstate switched access services over the pre-price cap period are slightly lower than those calculated in the original F-U study, presumably due to differences in the data for the final period.[3] The historical productivity offset for all LECs--3.37 percent--compares with the F-U estimate of 3.49 percent. When the two price cap periods (1991 and 1992) are added to the analysis, the historical productivity offset falls to 2.67 percent.

II. DATA

This study examines eight post-divestiture periods: June 1984 through May 1985 (1984/85), June 1985 through May 1986 (1985/86), July 1986 through June 1987 (1986/87), calendar year 1988 (1988), April 1989 through December 1989 (1989), calendar year 1990 (1990),

[3]In the F-U study, data for the final period are forecasts of mid-year 1990 through mid-year 1991, while the current study uses calendar-year 1990 actual data. The biggest difference is that forecasted 1990/91 demand was about 5 percent higher than observed calendar-year 1990 demand.

calendar year 1991 (1991) and calendar year 1992 (1992).[4] The following tables show the CL and TS switched access revenue, demand and exogenous cost change data for all Tier-1 LECs in each access period.

III. METHOD

This study uses the same technique to calculate post-divestiture productivity offsets as was used in the F-U study. As before, there are two interpretations to our calculation. First--and most direct --we calculate the X value required in a hypothetical Balanced 50/50 price cap plan commencing in 1984 that would just reproduce the growth in prices over the period that would have occurred if regulation had kept earnings constant. Alternatively, using the observation that input price growth is the same for LECs as for the U.S. as a whole, this study estimates the LEC productivity differential--the difference between LEC total factor productivity growth (for interstate switched access services) and the U.S. total factor productivity growth embodied in the rate of growth of GNP-PI.

The historical data is treated as having been generated by seven price cap annual filings: initial rates are the 1984/85 rates and each subsequent rate period in the data is produced by an update filing. In principle, we begin with the actual 1984/85 rates for CL and switched access. For any given value of the productivity offset X, we use the actual changes in GNP-PI and CL growth and adjust the 1984/85 rates using the FCC's Balanced 50/50 formula to determine the 1985/86 rates. We conduct the process a total of seven times until 1992 rates are obtained. We then find the value of the X factor which would just produce the actual rate in the final (1992) period

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[4]In the F-U study only six post-divestiture periods were available. The definition of the first five periods was identical with the instant study. The sixth period used forecast data for the 12-month period July 1990 through June 1991 in the F-U study and is taken to be calendar 1990 in the present study. The current study thus differs slightly in data and results when compared for the first six periods with the F-U study.

This study, like the F-U study, is based on realized average revenue per minute instead of tariffed rates. The base period of the study is 1992; hence total revenues in each access period are restated to reflect the 1992 authorized rate of return (11.25 percent).[5] To account for exogenous cost changes, revenues in each period prior to 1992 are also adjusted to the level that would have occurred if the exogenous cost changes prior to that period had not taken place. Similarly, some exogenous changes affect demand (e.g., the direct assignment of WATS) and demand is thus recast to the level that would have occurred absent the exogenous change. Finally, the FCC price cap formula has a special treatment of CL and the average revenue per minute is adjusted as that formula would adjust it. The result is a value of X which, if applied in each of the seven hypothetical price cap update filings, would just produce the switched access rates actually observed in 1992, taking into account the details of the price cap adjustment formula, changes in the rate of inflation and the actual exogenous cost and demand changes which occurred during the period.

A. Exogenous Change Adjustments to Revenue

CL rates, TS rates and total switched access rates are computed as average revenue per minute of use, where revenue is adjusted for exogenous changes that would have been reflected in the CL and TS price cap indices. These exogenous changes were used in the F-U study and accepted by the FCC: (1) the transition of the subscriber plan factor (SPF) to 25 percent; (2) the revised separations treatment of local commercial operations expense (Account 645); (3) the direct assignment of closed-end WATS lines to the special access category; (4) the implementation of reserve deficiency amortization to compensate for inadequate depreciation levels; (5) the effects of the 1986 Tax Reform Act; (6) the revised separations treatment of central office equipment category 4 terminations; (8) the revised separations treatment of revenue accounting expenses (Account 662);

[5]Total revenue includes access revenue, as well as inside wire and customer premise equipment revenue.

(9) the adoption of a new Uniform System of Accounts (Part 32) in place of Part 31, including conformance of Parts 36 and 69 of the Rules to Part 32; and (10) the revised treatment of pension expenses.

Since the study uses the final year (1992) as the base, exogenous cost changes are cumulated relative to 1992. Thus the exogenous change adjustment for 1991 is the sum of the exogenous cost changes in 1992, and the adjustment for an earlier year (e.g., 1988) is the sum of the adjustments from 1992 through 1989. By this process revenue in each year is adjusted to the level that it would have been if 1992 rules had been in effect.

B. Other Revenue Adjustments

In keeping with the methodology employed in the F-U study, we make a number of additional adjustments to revenue. CL and TS revenue are recast to earn 11.25 percent, the currently authorized rate of return. The revenue requirements for inside wire (IW) and customer premise equipment (CPE) are removed. Equal Access conversion and Universal Service Fund (high cost fund) costs are also removed. Changes to NTS revenue requirements are adjusted to account for the removal of inside wire and CPE, evaluated at earnings of 11.25 percent.

C. Demand Stimulation

CL and TS rates in this study, like the F-U study, are computed as average revenue per minute of use. Each revenue adjustment (e.g., changes in the subscriber line charge or inside wire revenue requirement) altered the actual rate charged during the period and thus brought about a demand stimulation effect. Measuring stimulation from a 1984 base, the fact that carrier common line revenue requirements were generally adjusted downward during the 1984-1992 period means that higher demand was observed than would have occurred if these revenue requirements had not fallen. These decreases in revenue requirements are--by definition--not associated with increased productivity growth, so to estimate the LEC productivity differential from price changes during the period, we

would remove these price changes from the calculation. For NTS costs, that adjustment would not be enough, however, because the stimulation stemming from the exogenous cost reductions during the period would increase demand in later periods, thus overstating the reduction in adjusted revenue requirement per minute for the purpose of calculating X. If revenues are adjusted to nullify the effect of exogenous changes, then demand must similarly be adjusted. Otherwise, the reduction in revenue per minute caused by stimulation from exogenous cost changes would cause us to overestimate the rate at which LEC CL prices (per minute) were falling during the period.

1. Non-Traffic Sensitive

Let SLC denote the revenue collected by the local exchange carriers (LECs) from end users through the Subscriber Line Charge. Similarly, let EXOG be the total effect on annual revenue requirements of exogenous changes in costs. R_0 is the baseline (observed) LEC revenue derived from interexchange carrier switched access charges (both carrier common line and TS). To calculate stimulation due to subscriber line charges and exogenous cost changes, let R_1 be the hypothetical LEC switched access revenue from interexchange carriers if there were

(i) no subscriber line charges paid by end users and the revenue shortfall were collected from interexchange carriers through higher switched access charges and

(ii) no changes in revenue requirements due to exogenous events.

Thus, R_1 exceeds R_0 by the amount of revenue collected from the SLCs and the exogenous cost changes:

$$R_0 = \textit{Base Carrier Access Revenue} = [\ \textit{CL Rev} + \textit{TS Rev}\ ] - \textit{SLC}$$

and

$$R_1 = R_0 + \textit{SLC} + \textit{EXOG}\ .$$

We wish to calculate the reduction in demand that would be caused by a hypothetical increase in switched access prices charged to interexchange carriers to replace the actual SLC revenue received from end users and the revenue requirement removed by the exogenous cost changes. The negatives

of these reductions in demand are our estimates of the stimulation in interstate switched access usage due to the implementation of SLCs and the exogenous changes in cost.

For simplicity, we assume the demand function for LEC interstate switched access usage has a constant elasticity given by β, so that

$$q_i = Ap_i^{\beta} \quad (i = 1,0) ,$$

and

$$R_i = p_i\, q_i = p_i \times Ap_i^{\beta} = Ap_i^{\beta + 1} .$$

It then follows that:

$$\frac{R_1}{R_0} = \left(\frac{p_1}{p_0}\right)^{\beta + 1} ,$$

so that

$$\frac{p_1}{p_0} = \left(\frac{R_1}{R_0}\right)^{\frac{1}{\beta + 1}} .$$

Thus, the price change required to obtain a 10 percent revenue change differs from 10 percent. Rather than using a percentage price change calculated in this manner to calculate demand response, we can directly solve for the quantity q_1 which would result from imposing a price increase of the magnitude necessary to increase revenues from R_0 to R_1:

$$\frac{q_1}{q_0} = \left(\frac{p_1}{p_0}\right)^{\beta} = \left(\frac{R_1}{R_0}\right)^{\frac{\beta}{\beta + 1}} ,$$

so that

(1) $$q_1 = \left(\frac{R_1}{R_0}\right)^{\frac{\beta}{\beta + 1}} \times q_0 .$$

The increase in carrier access revenue due to the hypothetical increase in switched access prices caused by (i) the recovery of SLC revenue from interexchange carriers or (ii) the repeal of the

exogenous cost changes thus causes an interstate usage reduction from q_0 to q_1. We will take the difference $q_0 - q_1$ as our measure of interstate switched access demand stimulation caused by the implementation of SLCs or exogenous cost changes.[6]

2. Traffic Sensitive

This method is applied to calculate demand stimulation for CL and TS minutes of use. Demand stimulation from SLCs and exogenous cost changes artificially increases measured productivity growth related to NTS costs, since increases in usage do not affect costs. Hence the above calculation applies directly to NTS costs and is used to calculate demand stimulation for CL minutes of use.

Demand stimulation from SLCs and exogenous costs is largely irrelevant for TS costs since, to a first approximation, increases in TS demand increase interstate TS costs proportionally. One component of costs in the TS category are actually NTS: the costs associated with line termination at the switch. In the prior NERA and F-U studies, this fact was reflected in estimates of the TS stimulated minutes of use. Differing from the CL stimulated usage, TS stimulation was calculated by multiplying the CL demand stimulation percentages by the product of:

(i) the base switched TS minutes of use in each period and

(ii) the ratio of NTS line termination revenue requirements to total TS revenue requirements.

Thus, stimulation proportional to the line termination component of TS revenue requirements was used to adjust observed TS minutes of use. In the current study the same type of adjustment is made to TS adjusted revenues. The fact that revenue requirements increase less than proportionally with

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[6]Note that this development differs from the method used to calculate stimulation in previous USTA filings in several respects. First, it does not assume that the required percentage change in access revenue will result in an equal percentage change in interexchange carrier access prices. Second, it adopts a constant elasticity demand function. Finally, it calculates demand changes directly from the demand model, rather than multiplying the price elasticity by a percentage change in price, eliminating ambiguity from arc elasticities of demand.

TS demand is accounted for by increasing TS revenue by the product of proportional demand stimulation and the parameter in (ii). Prior to 1988, the parameter in (ii) was taken to be 0.2174, based on line termination revenue requirements of $1,314.1 million and total switched TS revenue of $6,043.3 million in the 1985/86 period. For 1988, 1989 and 1990, nine-tenths, seven-tenths and five-tenths of the line termination revenue requirement, respectively, was allocated to interstate on a basis independent of current minutes of interstate use. Hence the ratio of NTS line termination revenue requirements to total TS revenue requirements was taken to be 0.1957 (=0.9 * 0.2174) in 1988, 0.1522 (=0.7 * 0.2174) in 1989, 0.1087 (=0.5 * 0.2174) in 1990, 0.0652 (=0.3 * 0.2174) in 1991 and 0.0217 (=0.1 * 0.2174) in 1992. If k_t denotes that ratio, s_t denotes the percentage demand stimulation and $TS\ REV_t$ denotes TS revenue adjusted for exogenous cost changes, then TS revenue adjusted for stimulation is given by

$$TS\ REV_t \times [\ 1 + s_t\ (\ 1 - k_t\ )]\ .$$

3. Demand Elasticities

Since R_1, R_0 and q_0 are observable for all eight of the access periods in the current data set, all that is necessary to calculate demand stimulation is the price elasticity of demand for switched access service. Recall that LEC switched access charges make up approximately forty-five percent of AT&T's switched service costs.[7] This fact, coupled with the requirement that AT&T pass LEC access charge changes through to its price cap indices, suggests that only forty-five percent of the access price effect will flow through to the toll end user. Therefore, the price elasticity used in the above calculations will be 45% of the -0.723 switched service own price elasticity reported by AT&T.

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[7]This fraction, 0.45, is taken from the AT&T Tariff Filing Reference Package, 1986 Annual FDC Report, Schedule 1 (June 1987), as cited on page 18 of the August 18, 1988 Bellcore Study.

Let p_t and p_a be the price of toll paid by end users and the price of access paid by interexchange carriers, respectively. Because changes in LEC access prices are required to be fully passed through to customers as changes in toll prices,

$$\frac{\partial p_t}{\partial p_a} = 1 .$$

By definition, the price elasticity of demand for interstate switched service is given by

$$\beta^* = \frac{\partial Q}{\partial p_t}\,\frac{p_t}{Q} = -0.723 .$$

Similarly, the price elasticity of demand for switched access is

$$\beta = \left(\frac{\partial Q}{\partial P_t}\,\frac{\partial P_t}{\partial P_a}\right)\frac{P_a}{Q} ,$$

and, by multiplying and dividing by P_t, we obtain

$$\beta = \left(\frac{\partial Q}{\partial P_t}\,\frac{P_t}{Q}\right)\left(\frac{\partial P_t}{\partial P_a}\right)\left(\frac{P_a}{P_t}\right)$$

$$= \beta^* \times 1 \times 0.45 = -0.723 \times 1 \times 0.45$$

$$= -0.3254.$$

Thus, to calculate demand stimulation due to a hypothetical change in switched access revenue from R_0 to R_1, we use equation (1) with a value of β equal to -0.3254.

4. Base Year

Demand stimulation can be calculated relative to either 1984 or 1992. For a 1984 base, we note that observed demand in later years was (in net) stimulated by the effects of subscriber line charges and exogenous cost changes, both of which lowered interstate carrier access revenue requirements, carrier access prices and, finally, interexchange carrier long distance prices. Had these events not occurred, demand would have been lower in years after 1984 than was actually

observed. Hence the effect of stimulation using 1984 as the base year is to reduce subsequent demand. It was 1984-based stimulation that NERA calculated for filings in Docket CC 87-313 and that the FCC adopted and used in the F-U study.

Alternatively, the world can equally well be viewed from the 1992 perspective. That is, 1991 differs from 1992 in that revenue requirements are slightly higher in the former year because exogenous cost changes (and small subscriber line charge changes) are largely negative. Demand is thus somewhat repressed in 1991, relative to what it would have been under 1992 rules, because switched access prices--and thus long distance prices--would have been somewhat lower under the 1992 regime. Correcting this source of bias requires adding stimulated usage, cumulatively, to every year prior to 1992.

The current results reflect stimulation measured with a 1984 base--as done in previous NERA studies and the F-U study. We note that the resulting adjusted average revenues per adjusted minute of use differ somewhat between the two methods and the growth rates of those revenues per minute are also moderately different.

IV. RESULTS

Calculations were performed in order to compare implicit productivity growth before and during the price cap period. In each case we calculate the individual X value for CL (using the Balanced 50/50 formula) and for TS, as well as the unitary X which combines the individual Xs.

Each of these calculations uses F-U's methods. Essentially, CL and TS access rates are calculated in each period by dividing revenues (adjusted for exogenous events) by demand (adjusted for stimulation). These are the basic data for calculating the historical Xs; trend regressions are used to measure the growth rates of each of these prices over the 1984-1992 period. The Balanced 50/50

price cap formula is then applied successively to the original 1984/85 rates, using the historical values of the growth in GNP-PI and the average growth in minutes of use per line over the filing periods. The historical value of X is chosen so that the resulting 1992 rate is equal to the 1992 rate determined by the trend regression.

A unitary X is then calculated, using historical values of the required parameters and following exactly the method used by F-U. The resulting historical unitary X is the single productivity offset that--if used in the Balanced 50/50 formula--would just reproduce the price growth actually experienced over the 1984-1992 period. In the F-U study for the 1984/85-1990/91 period, the historical unitary X was 3.49 percent.[8] The Commission used the F-U historical X in setting the productivity target: in ¶ 96 of the Second Report and Order, the Commission determines the productivity target by averaging the F-U (short-term) and Spavins-Lande (long-term) offsets of 3.5 and 2.1 respectively to obtain an X of 2.8. The target of 3.3 is then set by explicitly adopting a 0.5 percent consumer productivity dividend. Presumably, the long-term productivity differentials have not changed significantly since 1990, so if the Commission were to repeat its previous analysis, the values of X shown in Table 1 are those that would be averaged with 2.1 to obtain an historical productivity offset, to which a consumer productivity dividend would be added.

Table 1
Productivity Offsets

	1984-1992 Period	**1984-1990 Period**
CL	2.96%	3.49%
TS	3.44%	5.24%
Unitary	2.67%	3.37%
g =	6.19%	6.45%
GNP-PI =	4.06%	4.05%
% SLC =	65.71%	61.94%

[8]F-U also calculated a "prospective" unitary X, using assumed values for growth in usage, growth in lines and the percentage of CL revenue recovered by SLCs, obtaining a slightly lower-than-historical value of 3.43 percent.

The historical unitary X over the entire period is 2.67 percent, which is below F-U's previous historical result. If the analysis is confined to the first six periods, the historical unitary X is 3.37 percent, which differs slightly from F-U's 3.49 percent for roughly the same period. The difference between the results over similar periods is a result of slightly different data: the F-U sixth period was forecasted data. For example, actual minutes for the sixth period were about 5 percent below the forecasts used by F-U. The unitary X for the first six periods is somewhat below its value for the longer interval including the price cap period, suggesting that some event slowed the real rate of decline of carrier access prices in the last two periods.

Table 2
Switched Access Revenue Data

	Unadjusted Revenue	
	CL	**TS**
1984/85	$10,172,842	$5,461,496
1985/86	$10,878,568	$6,562,000
1986/87	$10,213,735	$7,102,456
1988	$10,012,595	$8,231,744
1989	$9,807,040	$8,637,220
1990	$9,568,617	$8,492,946
1991	$9,395,161	$8,609,845
1992	$9,481,498	$9,054,015